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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,954	03/27/2001	Christopher J.R. Paszty	A-676B	9125

21069 7590 03/16/2007

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EXAMINER	
SPECTOR, LORRAINE	
ART UNIT	**PAPER NUMBER**
1647	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/818,954	PASZTY ET AL.	
	Examiner	Art Unit	
	Lorraine Spector, Ph.D.	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/19/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10,11,47-51,61 and 65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10,11,47-51,61 and 65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2/23/07
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/19/2006 has been entered.

Claims 1-8, 10, 11, 47-51, 61 and 65 are under consideration.

The objection to claim 8 under 37 CFR 1.75(c) as being in improper form is withdrawn in view of applicants amendment.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 65 remains rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 65 remains indefinite for lacking sufficient method steps or elements. There is nothing recited in the claim or claim 5, from which it now depends, that would allow production of an α2 subunit. Applicants traversal at page 10 of the remarks filed 12/19/2006 has been fully considered but is not deemed persuasive. As stated above, production of the α2 subunit is

essential to the claim, and there is no recitation of any element that would allow such production. Applicants attention is directed to MPEP 2172.01.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8, 10, 11, 47-51, 61 and 65 are are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

Claims 1-3, from which all other claims depend, have been amended to add specific wash conditions. Applicants point to page 145 of the specification for support for the amendments. However, the specification merely states that the washes were performed *for* 20, and 10 minutes respectively, not for *up to* 20 or 10 minutes.

Additional new matter is found in the recitation that substitutions are in the region extending from residue 25 to the C-terminus of SEQ ID NO: 1; as pointed out in the advisory action, applicants have not pointed out basis for this amendment in the specification as originally filed.

Claims 1-8, 10, 11, 47-51, 61 and 65 remain rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a nucleic acid of SEQ ID NO: 2 or that encodes SEQ ID NO: 1, does not reasonably provide enablement for the breadth of the claims, which encompass numerous fragments, derivatives, etc. of such. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

Although portions of the claims have been amended, they remain extremely broad; note that the washes have no minimum length of time, such that substantial non-specific hybridization

is allowed. It remains that while and α2/β10 heterodimer wherein the β10 subunit has the sequence of SEQ ID NO: 1 binds to TSH receptors, it remains that that no activity has been shown to result from that; there is no evidence of record that the claimed subunit "is capable of regulating thyroidal function or promoting thyroid differentiation or proliferation". The newly discovered subunit may or may not stimulate the TSH receptor. It might just as well *prevent* signaling through that receptor. In the absence of any information as to what the biological activity is, the specification merely provides an invitation to experiment to determine what the α2/β10 heterodimer does, and then develop methods of using it based upon those observations. Such an invitation to experiment is not enabling. As stated previously, the only *enabled* use for the α2/β1 heterodimer is for thyroid imaging. The specification provides no guidance or working examples of variants of the disclosed β10 subunit, and given the previously considered evidence that the effect of structural alterations in the glycoprotein hormones is not predictable (Nakabayashi et al.), and that the newly identified glycoprotein hormone differs substantively from the previously known four species, in that its subunits may *not* be interchanged with those of the other known family members. Thus, the art evidences a lack of predictability in making alterations to glycoprotein hormones in general, and α2/β10 in particular. Accordingly, the rejection is maintained.

Applicants argue that the protein encoded by the claimed nucleic acids is capable of regulating thyroidal function. This argument has been fully considered but is not deemed persuasive for reasons of record at page 6 of the First Action on the Merits, mailed 11/21/2006, which states that behavior of the α2/β10 dimer in transgenic animals is not enabling of a use. It remains that the only enabled use is for thyroid imaging. Because the claims specifically recite a functional limitation that "when heterodimerized to human α2 polypeptide, is capable of regulating thyroidal function or promoting thyroid differentiation or proliferation", there must be enablement for that use. However, there is none, for reasons of record.

Based upon the breadth of the claims, the lack of working examples of any variants, and the specific limitation in the claims that the claimed nucleic acid encode a polypeptide that "when heterodimerized to human α2 polypeptide, is capable of regulating thyroidal function or promoting thyroid differentiation or proliferation", the claims are not enabled. Since the claims

are broad and do not require that the claimed species are useful for thyroid imaging (which may not be supported by the specification), it remains that the specification does not teach how to make a commensurate number of species that may be used for thyroid imaging, which is the sole enabled use, nor how to use the innumerable species that may not be used for thyroid imaging. Accordingly it remains that enablement is not commensurate with the scope of the claims.

Claims 1-8, 10, 11, 47-51, 61 and 65 remain rejected under 35 U.S.C. § 112, first paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for reasons of record in the first office action on the merits, mailed 11/21/2002.

Applicants arguments, filed 12/19/2006, have been fully considered but are not deemed persuasive. Applicants argue that the claims have been amended to better define the hybridization conditions; this is not persuasive for reasons cited above; there is no minimum time of washing, such that the recited conditions are not stringent. At page 14, applicants argue that if one strand is described, then the complementary strand is also described. The Examiner does not disagree. However, in this case *neither* strand of the nucleic acid has been adequately described.

Claim Rejections - 35 USC § 102 and 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2, 4-5, 7 and 11 remain rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative under 35 U.S.C. § 103(a) as being obvious over G.G. Mahairas et al., Locus AQ495547 disclosed 4/28/99 for reasons of record G.G. Mahairas et al. disclose Locus AQ495547, which has 100% identity to basses 22-209 of SEQ ID NO: 2. Because that nucleic acid would inherently hybridize to that of SEQ ID NO: 2 and encode a polypeptide with at least one activity of the polypeptide encoded by SEQ ID NO: 2, it meets the limitations of claim 1, and given the formulae for calculating percent identity in the specification (page 20, line 30) also meets the limitations of claim 2, and is truncated, meeting the limitations of claim 3. The nucleic acid was cloned into a pBACe3.6 vector, bacterial artificial chromosome, hence the vector was necessarily propagated in prokaryotic (bacterial) cells.

As stated in the original rejection, "The claims require that "the encoded polypeptide, when heterodimerized to human $\alpha 2$ polypeptide, has an activity of the human $\alpha 2/\beta 10$ heterodimer. The examiner is unable to determine whether the prior art disclosure possesses the unrecited characteristics or property. The nucleic acid of Mahairas encodes residues 8-70 of the protein of SEQ ID NO: 1, however, it cannot be determined whether this is sufficient to heterodimerize with $\alpha 2$, nor what the characteristics of such heterodimer would be, although it is fairly certain that it would at least have the activity of $\beta 10$ of comprising at least one antibody-binding epitope of such. With these conditions, where the product seems to be identical except that the prior art is silent to the characteristic or property claimed, then the burden shifts to applicant to provide evidence that the prior art would neither anticipate nor render obvious the claimed invention. Note the case law of *In re Best* 195 USPQ 430, 433 (CCPA 1977)." While the claims have been amended to be more specific with regard to the function, now stating

"capable of regulating thyroidal function or promoting thyroid differentiation or proliferation", such is not sufficient to overcome this rejection, as (a) the newly recited activities are not themselves enabled, for reasons of record, and (b) because it remains that the burden has been shifted to applicant on the basis of structural similarity of the claimed nucleic acids to those of the prior art, which meet all structural limitations of the rejected claims. It remains that the burden has been shifted to applicants to show that the prior art nucleic acids *do not* possess the claimed characteristics, as the Examiner does not possess facilities for doing so. Applicants have not met that burden.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-8, 10, 11, 47-51, 61 and 65 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 100-116 of copending Application No. 10/449140. Although the conflicting claims are not identical, they are not patentably distinct from each other because they overlap extensively in scope; the copending claims correspond to the instant claims as originally filed.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Lorraine M. Spector. Dr. Spector can normally be reached Monday through Friday, 9:00 A.M. to 3:00 P.M. at 571-272-0893.

If attempts to reach the Examiner by telephone are unsuccessful, please contact the Examiner's supervisor, Ms. Brenda Brumback, at telephone number 571-272-0961.

Certain papers related to this application may be submitted to Technology Center 1600 by facsimile transmission The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. § 1.6(d)). NOTE: If Applicant does submit a paper by fax, the original signed copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers in the Office.

Official papers filed by fax should be directed to 571-273-8300. Faxed draft or informal communications with the examiner should be directed to ***571-273-0893.***

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lorraine Spector

Lorraine Spector, Ph.D.
Primary Examiner

6/15/2006